Defense Information Systems Agency

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SATCOM-GIG Integration

Overview for DISA Customer Conference

DISA NSE32

15-18 August 2011

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Agenda

- **SATCOM-GIG Integration Background**
- **ISOM JCTD**
  - **Planned Capabilities**
  - **Demonstrations**
  - **Schedule**
- **ISOM Transition to Operations**

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SATCOM-GIG Integration Initiatives

USSTRATCOM/DISA Goal: Integrate SA, Planning, Network Mgmt & Control across SATCOM, DISN and other networks of the GIG

- **SATCOM-GIG Integration Vision and Strategy (2007)**
  - –In October 2006, recognizing the need for integrated SATCOM-GIG management, the former DISA Deputy Director MG Quagliotti requested that USSTRATCOM and DISA jointly lead the development of a vision and strategy document
  - –Resulting document recommended development of detailed Roadmap
- **SATCOM-GIG Integration Roadmap (2009)**
  - –Established a set of detailed recommendations to advance GIG NetOps
  - –Leveraged industry standards and best practices for network and service management integration
  - –Initiated effort to ensure DoD requirements, acquisition, and management processes can be influenced to achieve the NetOps vision
- **Initial Roadmap Step: Integrated SATCOM-GIG Operations and Management (ISOM) JCTD (2010 – 2013)**

Ongoing DISA and STRATCOM initiatives provide basic framework for implementing the vision and strategy

SATCOM-GIG Integration Vision and Strategy

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Findings:

- SATCOM & Terrestrial systems are managed in isolation
- Data sharing schemes and interfaces are not standard
- Rapid capacity management for warfighters is not provided

Unified View into the DVB-RCS System
Unified SATCOM-GIG View and Capability
Missions and Objectives
Operations and Management
Devices and Technology

Integration Goals:

- Dynamic Planning
- Rapid Provisioning
- Comprehensive Situational Awareness (SA)
- Rapid Response to Changing Mission Needs

SATCOM-GIG Integration is Key to Unified SA & Rapid Response

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SATCOM-GIG Integration Roadmap

- **SATCOM-GIG Integration Roadmap completed July 2009**
- **Recommendations:**
  - **Demonstrate Initial Capability via JCTD**
    - **Integrated SATCOM-GIG Operations & Management (ISOM) JCTD focused on:**
      - IP Reachback Networks over SATCOM
      - Development / Lab Work / Live Demos
      - Transitions to Operational Use
      - Advance Government requirements in industry forums
  - **Develop Network Access Request (NAR) Process**
  - **Establish GIG Governance Working Group**
  - **Develop Initial Capabilities Document (ICD)**
  - **Develop Architecture and Interfaces**
    - **Standard Interfaces, NGOSS Processes, Data models, etc.**
    - **Develop Security Architecture**
    - **Advance & Mature PBM technology**

SATCOM-GIG Integration Moving Forward in Short and Long Term

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ISOM JCTD

- **Approved and endorsed by NC-FCB (May 2009)**
  - Approved for FY10 Immediate Start (March 2010)
    (ISOM JCTD year 2 execution underway)
- **Address the Warfighting Commanders' Top Priority Questions**
  - What IP SATCOM network resources are available right now?
  - What capabilities are impacted by satellite or gateway failure?
  - What are my alternatives to accommodate surge mission requirements?
  - What are the alternatives that can be included in a Disaster Recovery Plan?
- **Improve SATCOM utilization through application of SATCOM resource monitoring and management**
- **Enable SATCOM integration into the GIG NetOps framework**
- **Capabilities to be demonstrated:**
  - Integrated, Web-based IP SATCOM Network Situational Awareness (SA)
  - Web-based SATCOM policy control to the JTF CDR to implement commander's decision based on mission requirements
  - SATCOM Network SA information to GIG management elements to enable enterprise-wide anomaly resolution and execution

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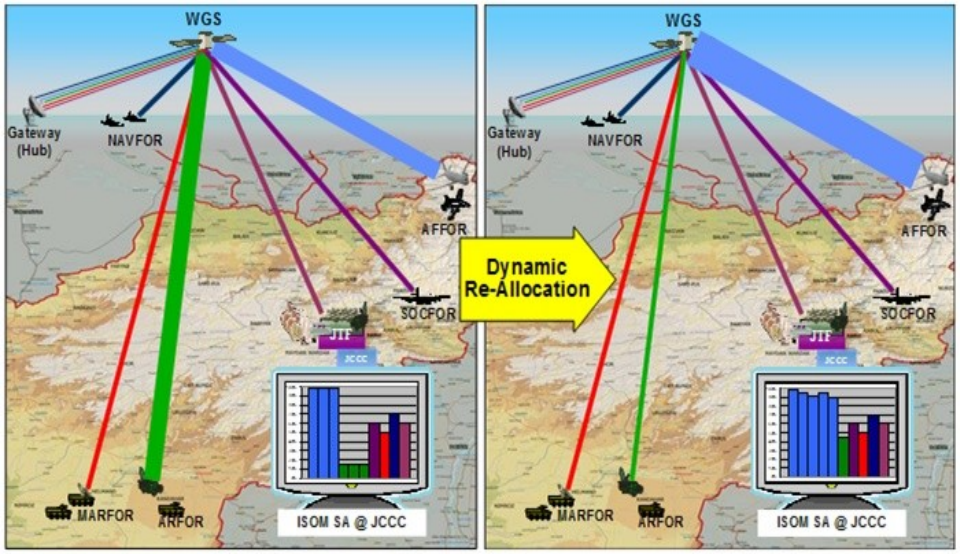
ISOM Planned Capabilities

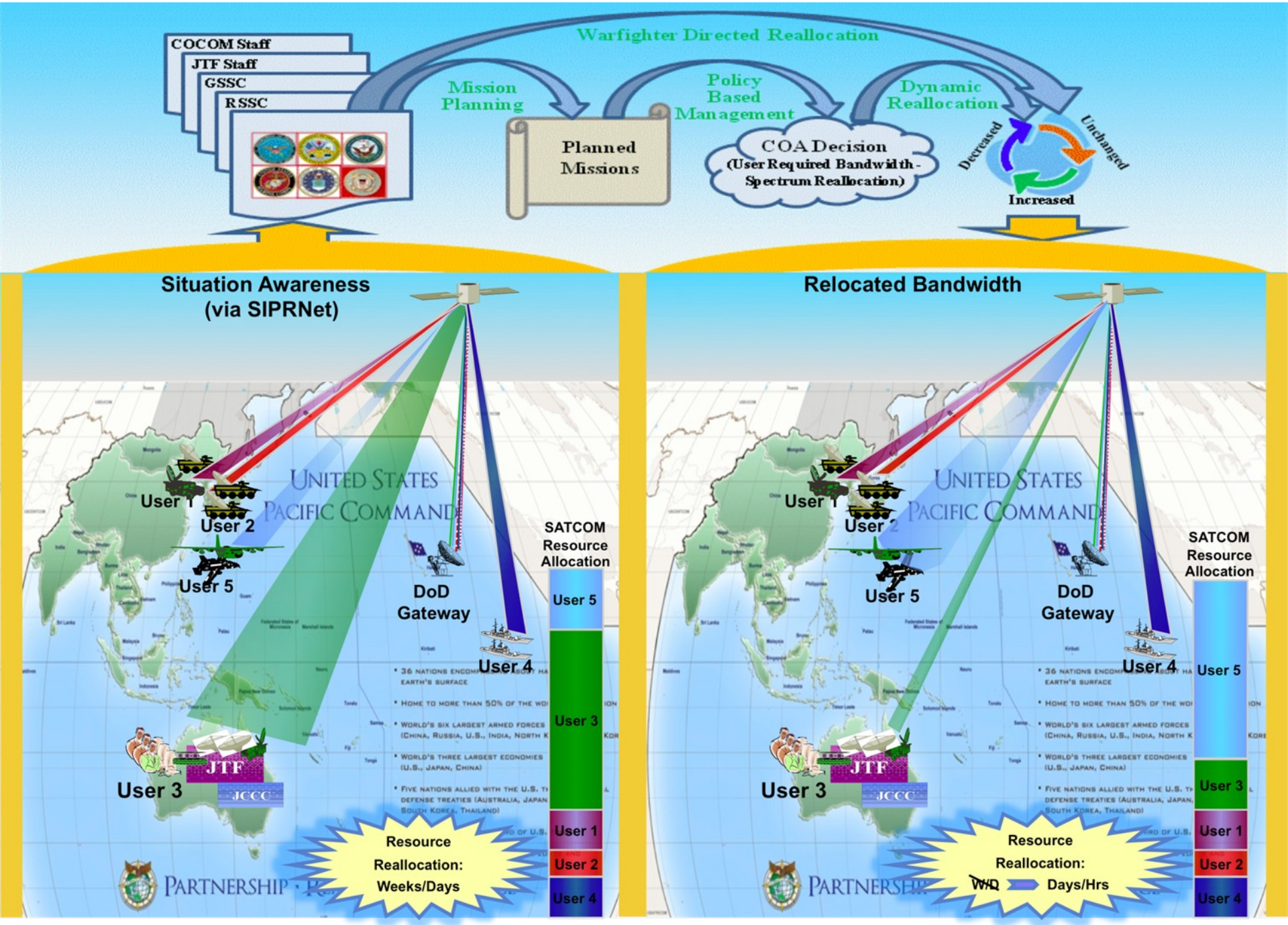
ISOM (OV-1)



1. **Enhanced Situational Awareness** for DoD Gateway Reachback
   - Integrated Operational Picture commonly available to all GIG Management Elements via Web Services
   - Limited mission planning support to address surge requirements

2. **Scalable, policy-based management (PBM)** system that enables dynamic allocation and provisioning of SATCOM and GIG resources for DoD Gateway Reachback:
   - Quickly (within minutes) adapt to changes in mission profiles or priorities (current processes take hours/days)
   - Dynamically shift resources between networks to aid mitigation of outages, congestion, etc.

ISOM Operations in (a single type of) an IP Modem Network



ISOM Demonstrations

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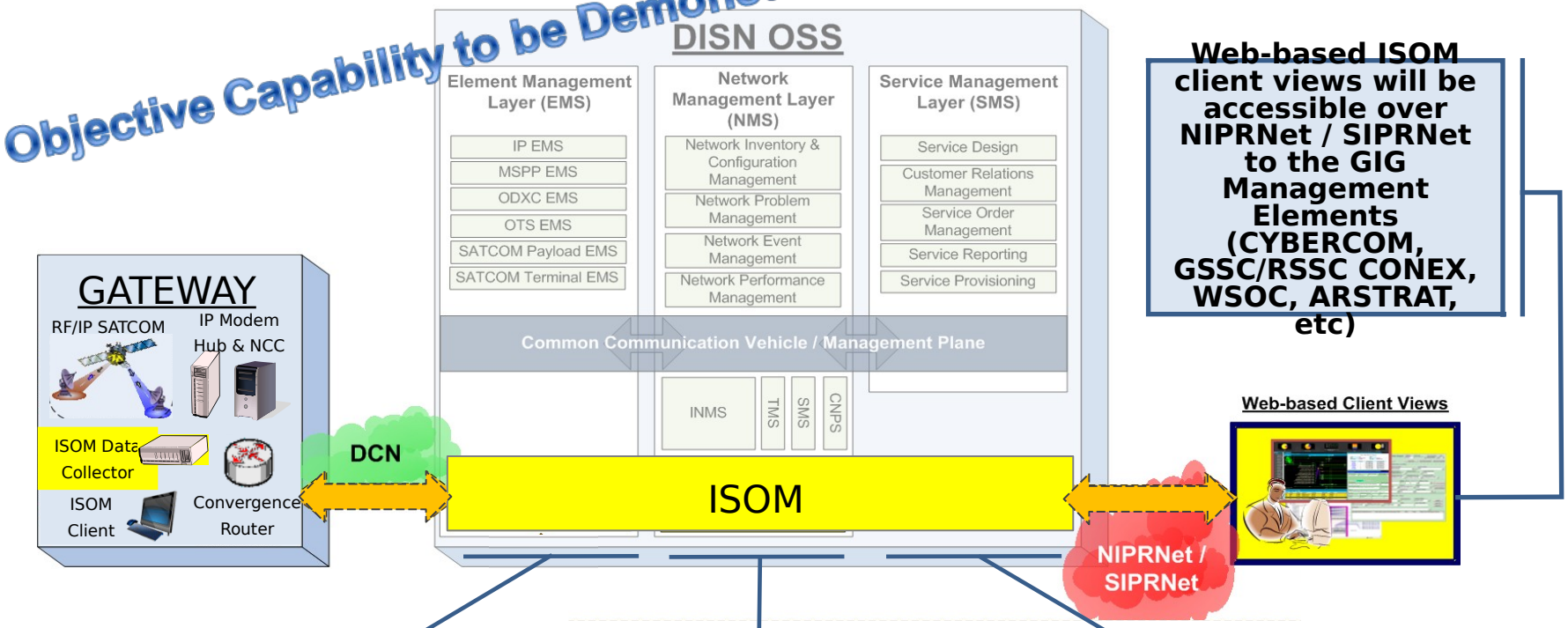
- **Web services and IP SATCOM systems at DoD Gateways are key components of ISOM**
  - Spiral (year) 1: IP SATCOM network situational awareness in a lab environment
  - Spirals 2 & 3: Network SA and dynamic resource allocation based on performance statistics in increasingly relevant operational environments


Objective Capability to be Demonstrated
DISN OSS
Element Management Layer (EMS)
IP EMS
MSPP EMS
ODXC EMS
OTS EMS
SATCOM Payload EMS
SATCOM Terminal EMS
Network Management Layer (NMS)
Network Inventory & Configuration Management
Network Problem Management
Network Event Management
Network Performance Management
Service Management Layer (SMS)
Service Design
Customer Relations Management
Service Order Management
Service Reporting
Service Provisioning
Common Communication Vehicle / Management Plane
INMS
TMS
SMS
CNPS
GATEWAY
RF/IP SATCOM
IP Modem
Hub & NCC
ISOM Data Collector
ISOM Client
Convergence Router
DCN
ISOM
NIPRNet / SIPRNet
Web-based Client Views
Web-based ISOM client views will be accessible over NIPRNet / SIPRNet to the GIG Management Elements (CYBERCOM, GSSC/RSSC CONEX, WSOC, ARSTRAT, etc)
ISOM will act as an EMS in the DISN OSS, collecting IP SATCOM / Situational Awareness data via the DCN
ISOM will act as a NMS in the DISN OSS, correlating the data from the Gateway and the IP SATCOM systems, providing PBNM and resource allocation capabilities
ISOM will support service delivery including DISN network services

ISOM Spiral 1 Demonstrations

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- **Completed TD1 (Oct 2010)**
  - Implemented the ISOM Situational Awareness (SA) portal and PBM capabilities
  - All SA Demo Cases procedures were executed and evaluated: "Pass"
  - OTA expressed confidence in the ISOM SA capability observed during TD1

- **Completed OD1 (Jan 2011)**
  - Provided ISOM portal training to users / operators from TRANSCOM, NORTHCOM, and Army National Guard 261st Signal Brigade
  - Developed OD1 scenario and vignettes with a focus on using ISOM SA capabilities to aid operators in maintaining the overall health of the IP SATCOM network
  - Demonstrated operational utility of ISOM through the scenarios and user assessment activities
    - Inventory , Link Congestion, and Link Failure
  - Gathered feedback from users on ISOM SA Portal and Riverbed technical demonstrations
    - Users affirmed ISOM path and objectives
    - Quote from NORTHCOM and TRANSCOM - "could deploy the ISOM capability TODAY to manage its large IP SATCOM network"

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ISOM Spiral 2 & 3 Demonstrations

- **TD2/OD2 is planned in fall/winter as a two part demonstration**
  - **Demo A: SA on Operational Network**
    - Integrated with iDirect hubs at 2 Teleports: Camp Roberts and Northwest
    - Potential to add Landstuhl/Lago Teleports
    - DCN Accreditation
  - **Demo B: PBM in the Lab Environment**
    - Conducted via the ISOM iDirect Testbed Network
- **TD3/OD3 is planned in 2012**
  - Integrated SA & PBM capability in fully operational network

ISOM JCTD End-State (OD-3) Architecture

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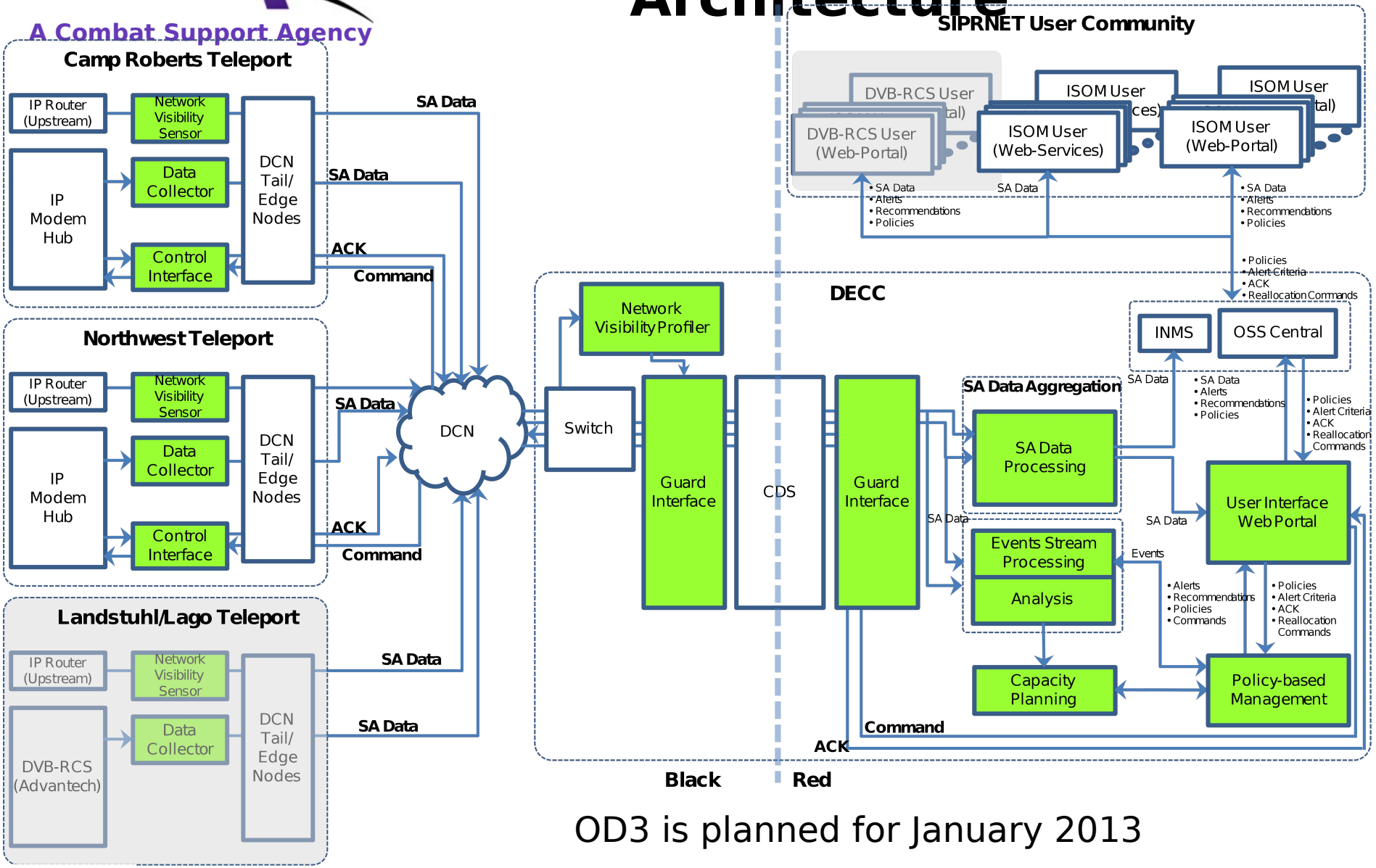

OD3 is planned for January 2013

=ISOM Functional Component

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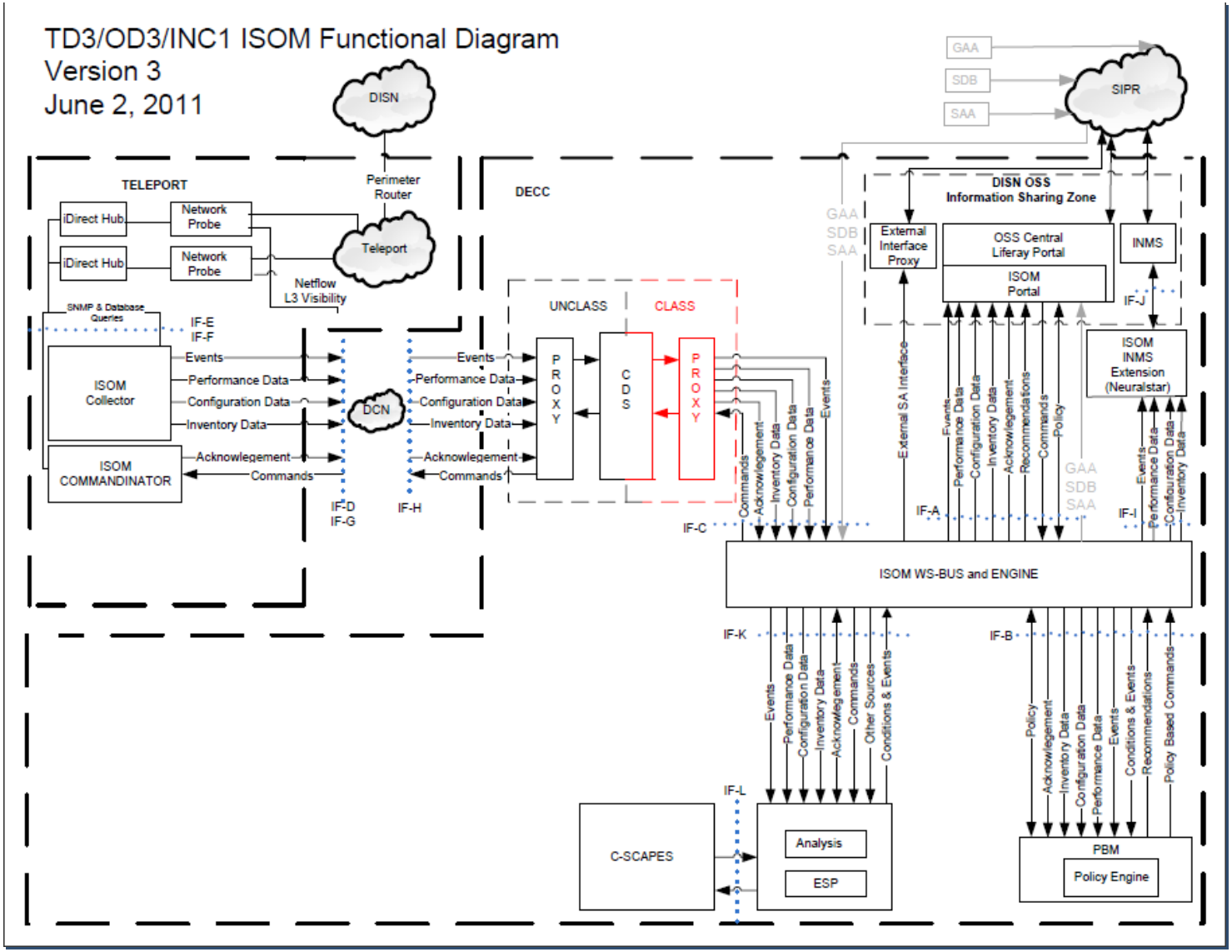
ISOM JCTD End-State Functional Diagram



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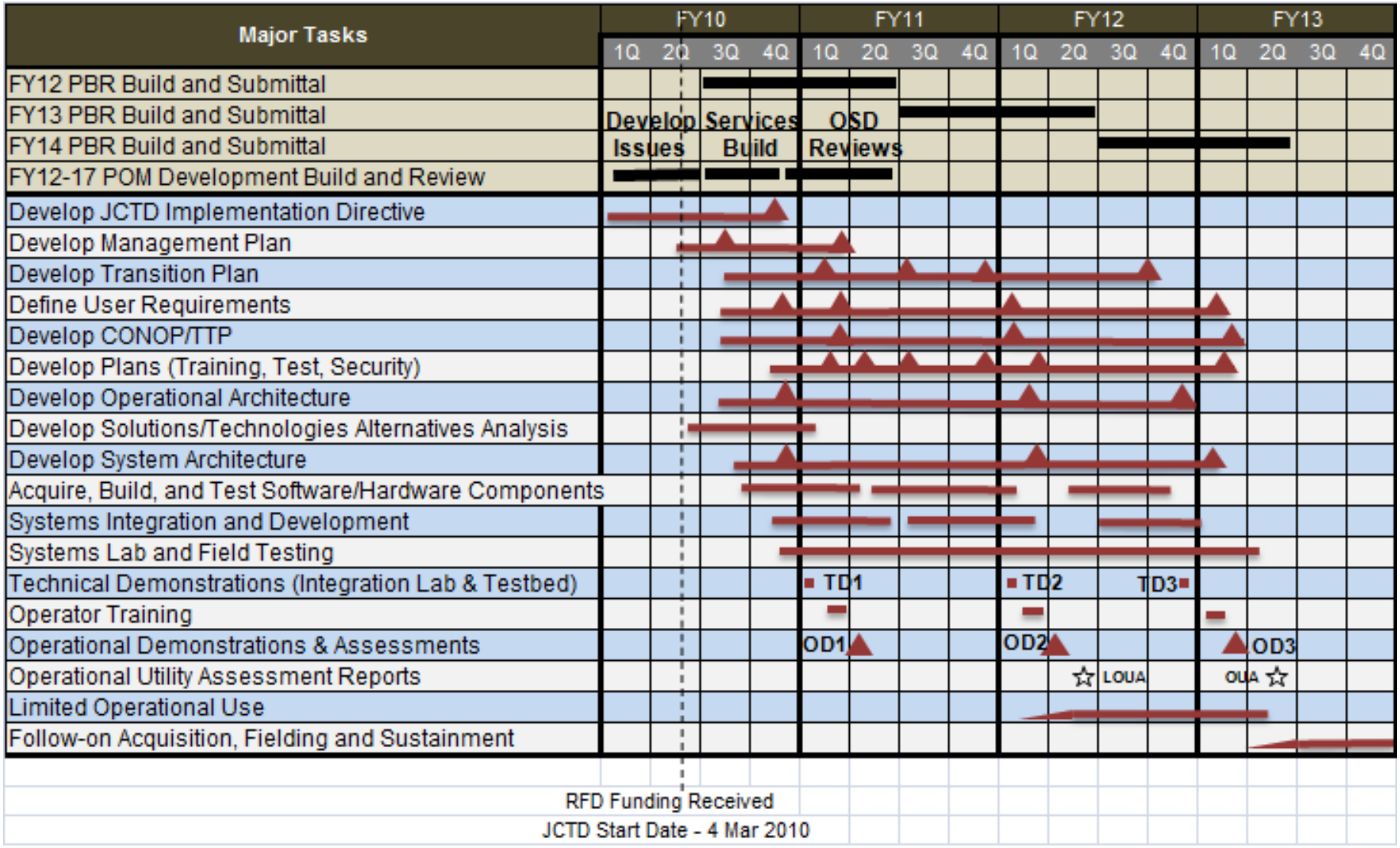
ISOM JCTD Schedule



ISOM Transition to Operation

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- **Organizational and Programmatic Approach**
  - Identify Program of Record (DISN) for transition
  - Prepare Transition Plan to ensure smooth transition
  - Convene Transition IPT discussions to address transition issues and lead POM development
- **Software and Hardware**
  - ISOM Data Collectors at DoD Gateways (Teleport & STEP sites)
    - Initial fielding at Northwest and Camp Roberts Gateways
  - ISOM Master Server located at Theater NetOps Centers / DECC
  - Policy Engine within the ISOM Master Server -- receives policy commands and executes them on the SATCOM Network
  - Common Interface software, loaded on the servers to enable Network Management communication between the SATCOM Network equipment and GIG Management Tools
  - Web services, used by the ISOM Master Server to publish SATCOM SA information to the JTF/COCOM and GIG Management Elements
- **Envisioned Future (post-JCTD) Efforts**
  - Fielding at all DoD Gateways
  - Evolved Capability to Integrated Transport Operations & Management (ITOM)

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SATCOM-GIG Integration Summary

- **SATCOM-GIG Integration enables:**
  - **Comprehensive Situational Awareness**
  - **Rapid Response to Changing Mission Needs**
- **Leverages Industry Standards**
  - **Common Interfaces**
  - **Simplifying Data Sharing**
- **Roadmap provides Path Forward for Unified Planning, Mgmt & Control of Warfighter Communications Assets**

SATCOM-GIG Integration Advances NetOps Vision and GIG Convergence

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ISOM JCTD Accomplishments

- ✓JCTD Approved – Oct 2009
- ✓JCTD Funding Received due to CRA – Mar 2010 (Actual Start)
- ✓Implementation Directive (ID) signed – Oct 2010
- ✓ISOM Technical Demo #1 - Oct 2010
- ✓Operational Requirements Draft – in development
- ✓ CONOPS/TTPs Draft – in development
- ✓ Operational Demo #1 – January 2011
- ✓Management Plan (MP) Approved – May 2011
- ❑ Two-Way High Speed CDS Analysis
- ❑ Northwest and Camp Robert Teleport Integration

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Scope of ISOM JCTD

Provide the Warfighter and Community of Interest:

- Situational Awareness (SA) of Wideband MILSATCOM IP Networks resources with network alerts
- Reallocation recommendations
- Dynamic resource reallocation capability

Benefit:

- More effective management of MILSATCOM IP resources
- Near real-time monitoring of IP network link Quality of Service with status alerts
- Policy based corrective action recommendations
- COCOM/JTF Comm Planners and Network Managers the ability to dynamically reallocate their MILSATCOM IP resources to fit their mission needs
- Accessible via the SIPRNET

Intended Users:

- SA: Wide community of interest
- PBM and Bandwidth Reallocation: COCOM/JTF Comm Planners and Network Managers

Operational Flow Diagram

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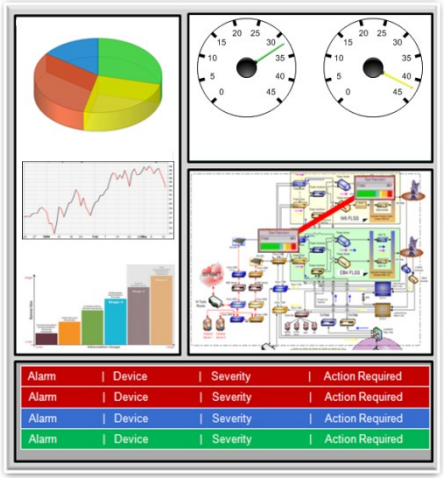
- Create Situational Awareness (SA) view of SATCOM resources
- Enable JTF & COCOM to use SA knowledge to effectively utilize the resources
- Provide JTF & COCOM the capability to provision SATCOM and Network services

Situational Awareness (SA)


Alarm | Device | Severity | Action Required
Alarm | Device | Severity | Action Required
Alarm | Device | Severity | Action Required
Alarm | Device | Severity | Action Required

- Reallocates SATCOM resources to accomplish mission
- Manages fenced resources to win the fight
- Ability to change Network resource allocations at the Gatew

JTF and COCOM Staff

Implement JTF / COCOM Intentions / Plans

Dynamic Resource Management

WGS

DoD Gateway

WISN

MUOS

Milstar / AEHF

Policies

- Optimized use of limited resources
- JTF & COCOM is the decision maker

GIG Management Elements

JTF CDR's intent best achieved through flexibility to optimize resource allocations based on situation